REMARKS

Applicants respectfully request entry of the Amendment and the reconsideration of the claims. Claims 73-74, 87-93, 100-110, 117-125, 127-128, 130, 132, 135-137, 143, and 145-162 have been amended. The specification has been amended to correct an obvious typographical error. No new matter has been added through the amendments. Claims 73-74 and 86-162 are pending. The Applicants respectfully request reconsideration and withdrawal of the pending objections to the specification and rejections under 35 U.S.C. §101, §102(b), and §112, first and second paragraph.

Comments Regarding Amendments to the Claims

Isolated. Claims 73-74, 87-92, 102-109, 119-124, and 147-162 have been amended to recite "DNA from an isolated cell" or "isolated DNA" to better clarify the scope of the claim.

Internal Periods. Claims 131 and 147 have been amended to remove internal periods.

Clarity. Claims 73, 91-93, 100-102, 108-110, 117-118, 125, 127-128, 130, 132, 135-137, 143, 145-153, and 159 have been amended for clarity and consistency. Support for the amendments can be found throughout the specification, including page 12, line 6 and page 19, lines 1-3.

Comments Regarding Previous Rejections And Objections to the Specification

Priority. The specification has been amended to correct the typographical error and recite "U.S. Provisional Application No. 60/153,233".

Flow FISH. The Examiner objects to the specification in the Office Action dated December 24, 2003, due to the recital of "flow FISH" at page 36, lines 5, 14, and 18 as being unclear. Flow FISH refers to flow cytometry using fluorescence *in situ* hybridization (FISH). The specification describes the analysis at page 36, lines 3-5 as the following:

> flow cytometric analysis following in situ hybridization with directly FITC-labeled (CCCTAA) peptide nucleic acid probe (flow FISH) (32, 33).

References 32 and 33 describe the flow FISH method developed by Rufer *et al.* These references are included in the IDS submitted with this amendment. Applicants respectfully assert that the meaning of flow FISH is clear by the explanatory sentence where flow FISH is first established, in addition to the specific references to the work by Rufer *et al.* Applicants respectfully request reconsideration and removal of this objection.

Comments Regarding Rejections under 35 U.S.C. §101

Non-statutory Subject Matter. The Examiner rejects claims 73-74, 87-92, 102-109, 119-124, and 147-162 under 35 U.S.C. §101 and asserts the claims are directed to non-statutory subject matter. The claims have been amended to recite "isolated DNA" and "isolated chromosome" as the Examiner suggested. The amendments should obviate the basis of the rejection, and thus Applicant respectfully requests reconsideration and withdrawal of this rejection.

Utility. The Examiner rejects claims 73-74 and 86-162 under 35 U.S.C. §101 and asserts the claimed invention lacks utility. Applicants respectfully traverse.

The instant specification recites several uses for isolated DNA, chromosomes, and nuclei as claimed. An isolated nucleus may be useful in re-cloning techniques (Specification at p. 14, lines 14-22). As suggested, re-cloning methods are

> useful for making transgenic mammals expressing more than one heterologous gene, or having more than one gene knocked out... *Id.* at lines 16-18.

The specification also describes several assays in which isolated DNA or isolated chromosomes would be useful. For instance, the specification at page 31, lines 3-10, describes an embodiment of cells transfected with a youthful gene or regulating sequences. The gene or regulating sequence would be identified from isolated DNA and thereby restricted out of the isolated DNA for use in cell transfection.

Figure 4 is an example of the utility of isolated DNA from cells obtained by nuclear transfer. In Fig. 4, genomic DNA was assayed to determine whether the telomere lengths were

extended. This is a method to determine whether the nuclear transfer technique was successful in rejuvenating the senescent cells.

Comments Regarding Rejections under 35 U.S.C. §102(b)

The Examiner rejects claims 73-74 and 86-162 under 35 U.S.C. §102(b) and asserts the claims are anticipated by Stice *et al.* (U.S. Patent No. 5,945,577) and by Cibelli *et al.* (*Science*, 1998, 280: 1256-1258). Further, the Examiner asserts the methods in the instant specification are the same as the methods taught in Stice *et al.* and Cibelli *et al.* According to the Examiner, the same product would result from these allegedly same methods. The Applicants respectfully traverse.

A prima facie case of "[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim." *Lindemann Mashinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984); *See also*, MPEP §2131. The Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teaching of the prior art. *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). The Applicants respectfully assert that the method taught by the instant specification is not the same as the method taught by Stice *et al.* or Cibelli *et al.*

The nucleic acid of the claimed invention is derived from methods comprising the nuclear transfer of senescent, near-senescent, or checkpoint-arrested cells. In Example One, the donor cells were fibroblasts cultured to within 0.8 population doublings from senescence (Specification at p. 32, lines 16-17). Cibelli *et al.* used fetal fibroblasts isolated from a day 55 fetus, passaged twice before the insertion of a reporter gene, and then passaged for an additional two weeks prior to nuclear transfer (p.1256, column 3). Since an average cell cycle is 28 to 30 hours (Specification at p. 32, line 15), the fibroblasts used in Cibelli *et al.* underwent 11.2 - 12 population doublings plus the two passages. The fibroblasts used by Cibelli *et al.* had undergone approximately half the number of population doublings (30) of the fibroblasts in the instant specification. The fibroblasts used by Cibelli *et al.* were not senescent, near-senescent, or checkpoint-arrested. The method of Cibelli *et al.* is not the same as the method taught in the instant specification since the donor cells were different.

Likewise, the methods described in the instant specification are not the same as the methods taught by Stice et al. The method taught by the instant specification differs by the use of **senescent cells as the donor cells** (Specification at p. 41, lines 4-6). As such, the method is does not anticipate the instant claims.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §102(b).

Comments Regarding Rejections under 35 U.S.C. §112, first paragraph

The Examiner rejects claims 73-74 and 86-162 under 35 U.S.C. §112, first paragraph. The Examiner asserts that the claims contain subject matter that did not convey possession of the claimed invention. Specifically, the Examiner asserts that there is no support for the comparison of telomeric repeats to other cells or cell types, nor any specific characterization of the length or location in the chromosome. Applicants respectfully traverse.

To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991); MPEP §2163. "If a person of ordinary skill in the art would have understood the inventor to have been in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate written description requirement is met." *In re Alton*, 76 F.3d 1168, 1175 (Fed. Cir. 1996). "[A] patent need not teach, and preferably omits, what is well known in the art." *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384 (Fed. Cir. 1986); MPEP §2163(II)(A)(2)(a).

At the time of filing, methods to compare telomeric sequences were well known. In Allshire *et al.* (1989, *Nucl. Acids Res.*, 17: 4611-4627), the authors found that human telomeres contain at least three types of repeat sequences. The authors ***compared*** the telomeric repeats in human sperm to the telomeric repeats in human blood (Fig. 6 at p. 4623). These repeats varied in length between the two cell types, sperm and blood (Fig. 7 at p. 4624). The uniformity of telomeric repeats includes the sequence of the repeats. The experiments to determine the

uniformity of the telomeric repeats utilized well known techniques, such as DNA digestion and hybridization (Allshire *et al.*, 1989; Bassham *et al.* 1997, *Mol. Cell. Biol.*, 18: 269-275). Applicants respectfully assert the comparison of telomeric repeats to other cells or cell types and characterization of the uniformity of telomeric repeats was well known at the time of filing.

The Examiner also cited a lack of support for the characterization for location of the more uniform repeats in the chromosome. By definition, telomeres are located at the ends of linear chromosomes (*See*, Tamarin, PRINCIPLES OF GENETICS (3rd ed. 1991) at p. 595).

Accordingly, comparison of telomere length and sequence between cells and cell types were well known at the time of filing. Applicants respectfully request removal of this rejection.

Comments Regarding Rejections under 35 U.S.C. §112, second paragraph

The Examiner rejects claims 73, 93, 102, 110, 125, 128, 131, and 147 under 35 U.S.C. §112, second paragraph. The Examiner asserts that the claims are unclear and confusing. The Examiner cites specific language in the claims, "more uniform" and "DNA from a cell", as the sources for his confusion.

Claims 73, 93, 102, 110, 125, 128, 132, 135, 148, and 151 have been amended to clarify the uniformity and the DNA that is the basis of the comparison. Claims have been amended to recite "tracts of telomeric tandem repeat sequences" as supported at page 12, line 6. Tracts of telomeric repeats can be interrupted by degenerate or non-telomeric repeat DNA in the telomere region, described in the specification at p. 9, line 11 to p. 11, line 2. "More uniform" tracts of telomeric tandem repeat sequences have less or no interruptions within their sequence by degenerate or non-telomeric DNA in the telomere region.

The Applicants are confused regarding this rejection as applied to claims 131 and 147. The language cited by the Examiner in this rejection is not recited in claims 131 and 147. All applicable claims have been amended to include the clarification.

Applicants respectfully request removal of this rejection.

CONCLUSION

In view of the foregoing, the Applicants believe that all claims as currently pending are in condition for allowance and such action is respectfully requested. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

MERCHANT & GOULD, LLC

Date: May 24, 2004

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